

WHAT IS CLAIMED IS:

1. A method for determining the structure of a ligand for a G protein coupled receptor, the method comprising the steps of:

5 providing a sensitizer-treated membrane comprising the one or more G protein coupled receptors;

providing a plurality of libraries of binding compounds, each library of binding compound having one or more molecular tags, each molecular tag being attached by a cleavable linkage, and the molecular tags of each library of binding compounds being distinguishable from those of every 10 other library of binding compounds by one or more physical and/or optical characteristics;

combining the sensitizer-treated membrane and the plurality of libraries of binding compounds specific such that in the presence of a G protein coupled receptor a complex is capable of being formed between such G protein coupled receptor and members of the libraries of binding compounds;

15 activating the sensitizer-treated membrane so that an active species is produced that cleaves the cleavable linkage of the binding compounds forming such complex so that molecular tags are released; and

separating and identifying the released molecular tags by the one or more physical characteristics to determine the relative binding strength of each library for the G protein coupled 20 receptor.

2. The method of claim 1 wherein said step of separating includes electrophoretically separating said released molecular tags, and wherein each of said molecular tags has a molecular weight in the range of from 100 to 2500 daltons.

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3. The method of claim 2 (a) wherein said sensitizer-treated membrane is a photosensitizer-treated membrane, (b) wherein said active species is singlet oxygen, and (c) wherein each of said molecular tags attached to said binding compounds are selected from a group defined by the formula:

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-L-(M,D)

wherein:

L is a cleavable linkage;

35 D is a detection moiety; and

M is a bond or a water soluble organic compound consisting of from 1 to 100 atoms, not including hydrogen, that are selected from the group consisting of carbon, oxygen, nitrogen, phosphorus, boron, and sulfur.

5 4. The method of claim 3 wherein D is a fluorescent label, a chromogenic label, or an electrochemical label.

5. The method of claim 4 wherein M is a polymer selected from any one of polyethers, polyesters, polypeptides, oligosaccharides, polyurethanes, polyamides, polysulfonamides, 10 polysulfoxides, polyphosphonates, and block copolymers thereof.

6. The method of claim 5 wherein D is a fluorescein.

7. The method of claim 6 wherein said fluorescein is selected from the group consisting of 5-15 and 6-carboxyfluorescein, 5- and 6-carboxy-4,7-dichlorofluorescein, 2',7'-dimethoxy-5- and 6-carboxy-4,7-dichlorofluorescein, 2',7'-dimethoxy-4',5'-dichloro-5- and 6-carboxyfluorescein, 2',7'-dimethoxy-4',5'-dichloro-5- and 6-carboxy-4,7-dichlorofluorescein, 1',2',7',8'-dibenzo-5- and 6-carboxy-4,7-dichlorofluorescein, 1',2',7',8'-dibenzo-4',5'-dichloro-5- and 6-carboxy-4,7-dichlorofluorescein, 2',7'-dichloro-5- and 6-carboxy-4,7-dichlorofluorescein, and 2',4',5',7'-20 tetrachloro-5- and 6-carboxy-4,7-dichlorofluorescein.

8. The method of claim 3 wherein L is selected from the group consisting of olefins, thioethers, selenoethers, thiazoles, oxazoles, and imidazoles.

25 9. The method in accordance with claims 1, 2, 3, 4, 5, 6, 7, or 8 wherein said plurality of molecular tags is in the range of from 2 to 50 and wherein each of said plurality of said libraries of binding compounds is a peptide library.